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TREATMENT OF EFFLUENT FROM TANNERY INDUSTRY BY NATURAL ADSORBENT

S. Banupriya[1],A.S.Mumtaj yasmeen[2,*],D.K.Nandhini[3,*], S.Ramya [4,*] ,M.Sumathi[5,*]
[1] Assistant Professor, Department of Civil Engineering, Vivekanandha College of Technology for Women.
[2,3,4,5,]UG student, Department of Civil Engineering, Vivekanandha College of Technology for Women.

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ABSTRACT

Tannery waste water contains harmful toxic chemicals like chromium,lime ,zinc and other heavy metals etc. These chemicals are cause environmental pollution and human disorder .In order to reduce BOD,COD, Total solids,Dissolved oxygen,lime and chromium. Many natural adsorbents are available to reduce the toxic chemical present in tannery waste water .There are neem, banana peel,OcimumBasilicum,OcimumTenuiflorum,orange,peel,ricehuskash.In that Ocimum Basilicum, Ocimum Tenuiflorum can be utilized to reduce the chromium and lime content Thus ,the recycled water utilized for the agricultural purpose. To check the result comparison using Isotherm model.

1. INTRODUCTION

Tannery is one of the most important industry in Erode district .Tannery waste water consumes more amount of water and does not utilised that water for agricultural purpose .Because ,it has toxic chemicals like Chromium (Cr),Ammonia (NH_3),,Lime and heavy metals like Cadmium(Cd),Arsenic(As) and Lead(pb).Tannery waste water discharge into river ,lake and canals etc,.Waste water contains toxic chemicals which is harmful to the living organism and toxic gases can be formed during the discharge time .Adsorbent is the more effective method to remove the heavy metals .The Adsorbent can be classified as physical ,chemical and natural adsorbent. Using chemical adsorbent ,the water properties can be changed .But using the natural adsorbent which is easy available and more economic

2. ADSORBENT

An adsorbent is a solid substances use to collect solids molecules from a liquid and gas. And, absorbent is often used to extract pollutants and it is a porous solid which blinds liquid or gaseous molecules to their own surface . Adsorbent used **OcimumTenuiflorum, OcimumBasilicum.** Ocimum Tenuiflorum is commonly known as holy basil. It is an aromatic perennial plant in the family Lamiaceae .It is native to India subcontinent and wide spread as cultivated plants through Southern asian tropics. Ocimum Basilicum is also great basil or saint joseph's wort herb of the family Lamiaceae.

3. OBJECTIVE

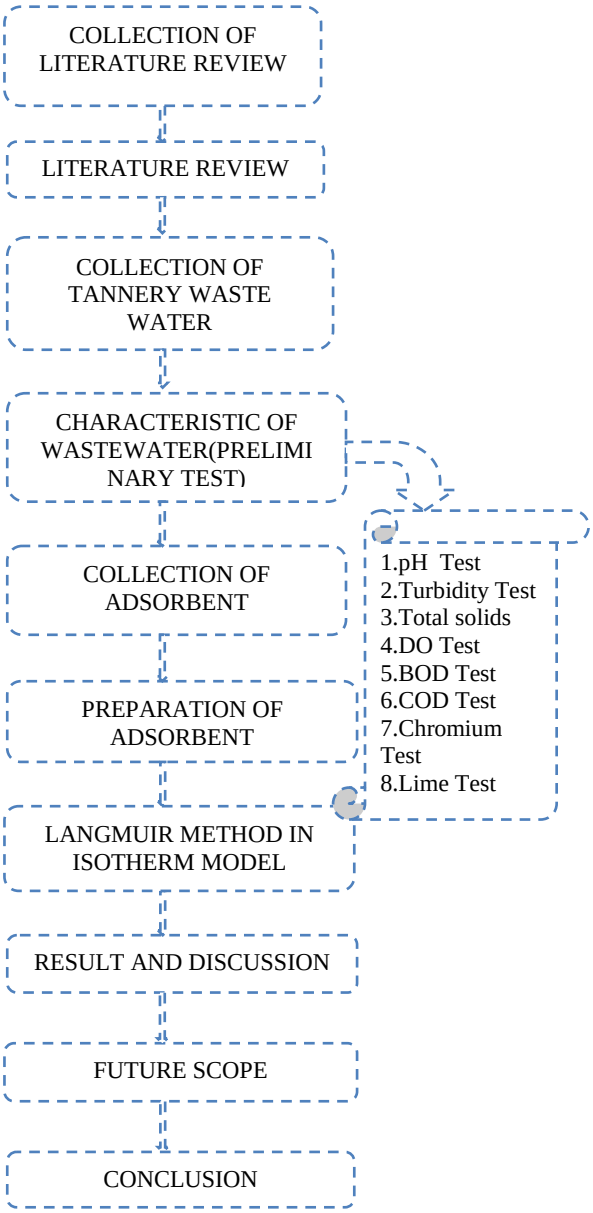
- The main objective of the project is to reduce the lime and chromium content by natural adsorbent
- Natural adsorbent which we use are Ocimum Tenuiflorum and Ocimum Basilicum comes under a family Lamiaceae
- By analysing the effect of waste by Langmuir and check whether waste is utilised for agriculture

SCOPE

- Tannery effluent waste water contains various types of toxic chemicals.
- High concentration of pollutants has already taken considerable dimension to threaten public health and environment.
- This situation creates necessity to study the pollution problems and to find out appropriate removal technique for removal of such pollutants.
- To reduce lime content in waste water using natural adsorbents**.**

3. METHODOLOGY

In this study we have collected tannery waste water. And we find the characteristics of water ,then natural adsorbents such as **Ocimum Tenuiflorum, Ocimum Basilicum** are collected.Then the adsorbent can be added to the wastewater for g/l. The reduction BOD, COD, DO, pH,Chromium can be checked. The treated water is checked for utilization of water for agricultural purpose.Isotherm model is used to compare the result.



4. MATERIAL COLLECTION

TANNERY WASTE WATER:

Waste water contain harmful toxic chemical like chromium,lime and heavy metals and .These chemicals are harmful to enivornment and human disorder . its not allowed to agriculture

ADSORBENT:

1.Ocimum Tenuiflorum

Osmium Tenuiflorum is commonly known as holy basil. It is an aromatic perennial plant in the family lamiaceae. It is native to the Indian subcontinent and wide spread as a cultivated plant throughout the Southeast Asian tropics.

Table.1:Scientific classification of Ocimum Tenuiflorum

Kingdom	**Plantae**
Clade	Angiosperms
Clade	Eudicots
Clade	Asterids
Order	Lamiales
Family	Lamiaceae
Genus	Ocimum

Figure 1:Ocimum Tenuiflorum

2.Ocimum Basilicum

Figure 2:Ocimum Basilicum

It is also called great basil or saint joseph s' wort is aculinary herb of the family lamiaceae.

Table.2:Scientific classification of Ocimum Basilicum

Kingdom	**Plantae**
Clade	Angiosperms
Clade	Eudicots
Clade	Asterids
Order	Lamiales
Family	Lamiaceae
Genus	Ocimum

5. PREPARATION OF ADSORBENT

Ocimum Basilicum and Ocimum Tenuiflorum. leaves are collected from plants .Ocimum Tenuiflorum is allowed to dry in sunlight for 1week and Ocimum Basilicum dried for 2days in sunlight And them it is grinded into powder form 100grams

Figure 3:Drying of adsorbent

6.TEST CONDUCTED

- pH test
- BOD test
- COD test
- Turbidity test
- Total solids
- Dissolved solids
- Lime test
- Chromium test

pH TEST

pH value denotes the concentration of hydrogen ions in the water and it is a measure of acidity or alkalinity of a substance.

$$pH=-\log_{10}(H+)$$

TURBIDITY TEST:

Turbidity is caused due to presences of suspended and colloidal matter in the water .Turbidity is a measure of resistance of water to the passage of light through it. Turbidity is expressed asNTU(NephelometricTurbidityUnits).

TOTALSOLIDSTEST:

Totalsolids in water is defined as the sum of the quantity of the suspended solid and dissolved solids. The quantity of suspended solids is determined by filtering the sample of water through fine filter drying and weighting.

BIOCHEMICAL OXYGEN DEMAND (BOD):

The quantity of oxygen required to oxidize the organic matter and bio-degradable substances is called biological oxygen demand.

CHEMICAL OXYGEN DEMAND(COD):

If the water is contaminated with sewage ,the demand of oxygen by organic matter in sewage is known Chemical oxygen demand.

S.NO	TEST CONDUCTED	PERMISSABLE VALUE	OBTAINED VALUE
1	pH	5.5-7.0	9
2	Turbidity	5-10	24.6
3	Total solids	20-1000	1200
4	DO	5-9	20
5	BOD	100	120
6	COD	500-1500	2000
7	Lime	40-60	35
8	Chromium	28-45	100

S.NO	TEST CONDUCTED	OCIMUM TENUIFLORUM	OCIMUM BASILICUM
1	pH	7	7
2	Turbidity	9.5	8.8
3	Total solids	650	520
4	DO	8.5	8.8
5	BOD	50	55
6	COD	1250	1150
7	Lime	42	45
8	Chromium	30.5	32

Units:

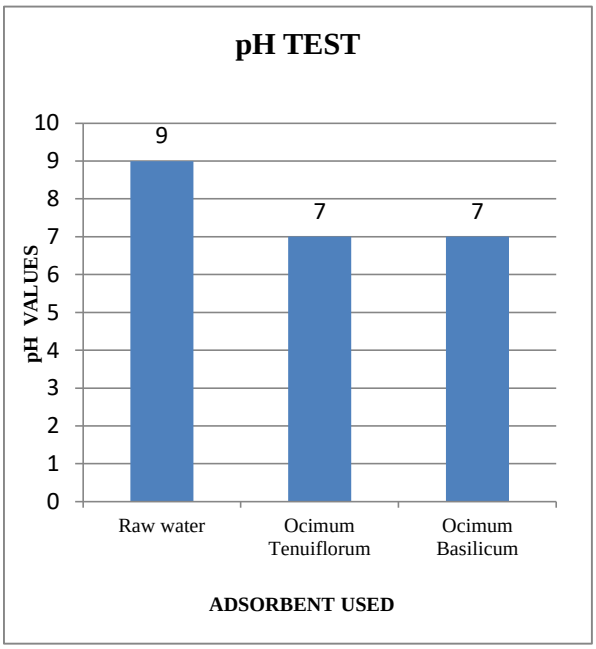
1.Turbidity -NTU

2.Total solids -mg/l

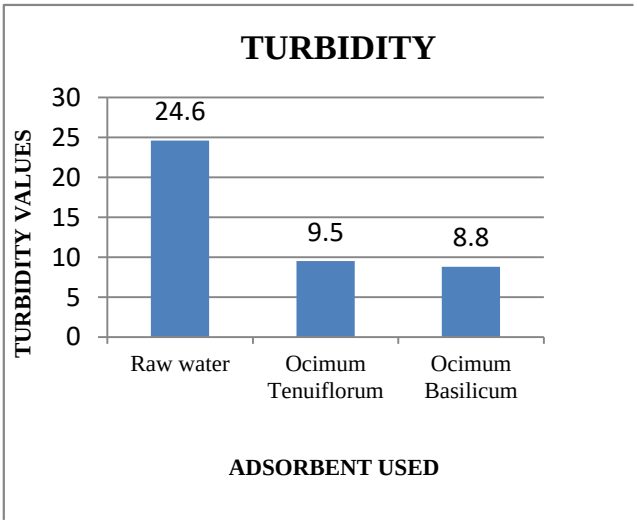
3.Dissolved Oxygen -ppm

4.BOD,COD,Lime,Chromium -mg/l

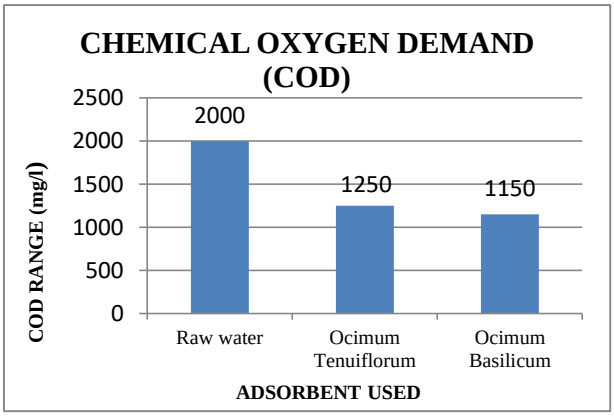
7.GRAPH



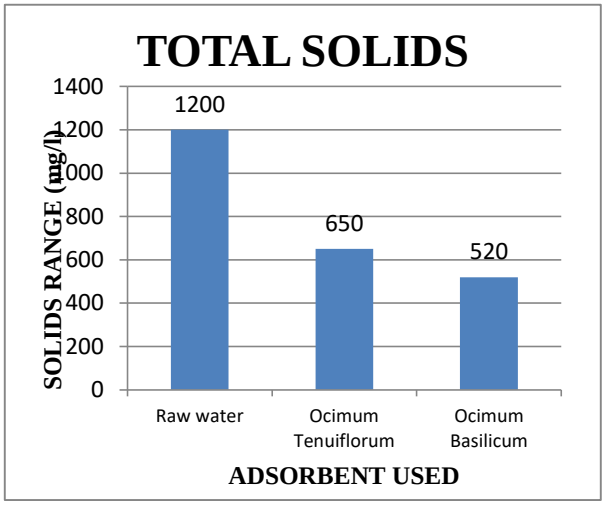
GRAPH1:pH Test



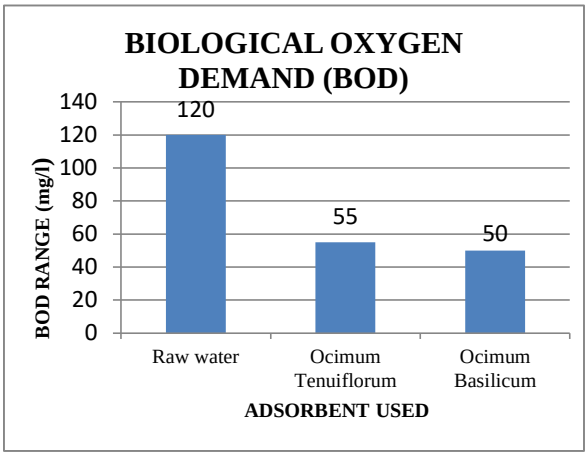
GRAPH 2:Turbidity Test



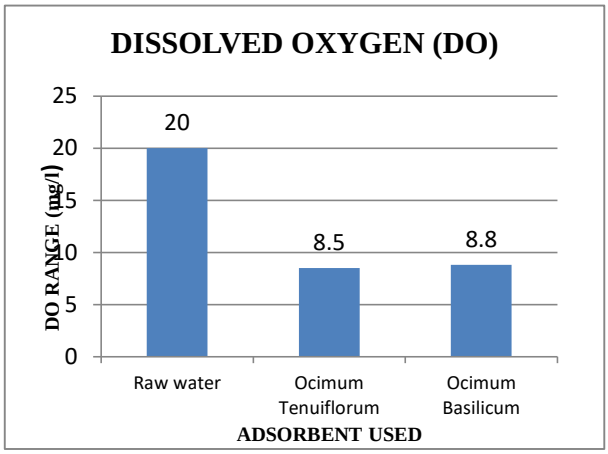
GRAPH 5:COD Test



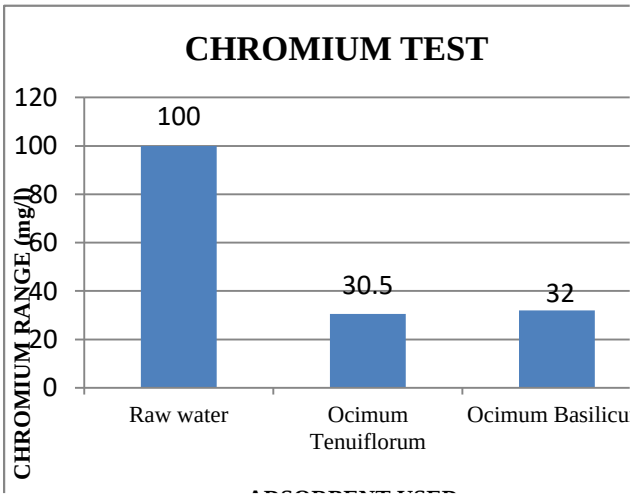
GRAPH 3:Total Solids Test



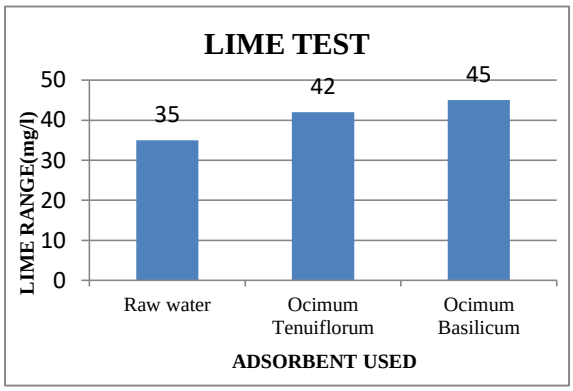
GRAPH 6:BOD Test



GRAPH 4:DO Test



GRAPH 7:Chromium Test



GRAPH 8:Lime Test

8. CONCLUSION

Natural adsorbents like Ocimum Basilicum Ocimum Tenuiforum was collected and powdered for the treatment.16 g/l of adsorbent is effective for both with the contact time of 2hours to reduce the pH, COD, BOD, DO,Chromium and to increase the lime for vegetation and fisheries. By the isotherm model we compare the test result.Ocimu Basilicum is effective than Ocimum Tenuiflorum.

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